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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/19/2001

Hiroto Hirakoso

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EXAMINER

TUCKER, WESLEY J

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

08/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/955,196	Applicant(s) HIRAKOSO, HIROTO	
	Examiner Wes Tucker	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed March 5th 2007 has been entered and made of record.
2. Applicant has amended claims 1, 3 and 7. Claims 2 and 4 have been canceled. Claims 1, 3 and 5-8 remain pending.
3. Applicant's remarks in view of the newly presented amendment have been fully considered but are not found persuasive for at least the following reasons:

Applicant argues that because the interpolation function composed based on both cubic and bilinear interpolation methods disclosed by Nakami is not explicitly a finite impulse response filter that the combination of Nakami and Suga do not collectively teach the claims as recited. Examiner disagrees. The function taught by Nakami is clearly composed of both cubic and bilinear functions and is furthermore asymmetric with respect to right and left. This is clear in fig. 19. Nakami does not discuss implementing the function using a FIR. However it is well known in the art that filters are used to perform and implement interpolation functions such as cubic and bilinear methods. Suga teaches that FIRs are used to implement any number of interpolation functions and explicitly mentions both cubic and linear methods. It only follows that a FIR would be used to implement the interpolation function disclosed by Nakami. Indeed Nakami's function will have to be applied to the image data in operation in some manner. The most common and exceedingly well-known method in

image processing for implementing an interpolation function is through the use of a filter. Suga clearly teaches that an FIR may be used in implementing both cubic and linear methods. One of reasonable skill in the art would obviously conclude that the combination function determined by Nakami would be applied using a filter and Suga teaches explicitly that a FIR filter is used.

The rejection in view of the combination of the Nakami and Suga references is therefore maintained and accordingly made FINAL.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,510,254 to Nakami et al. and U.S. Patent 6,707,467 to Suga.

With regard to claim 1, Nakami discloses an image processing method for a digital image, characterized in that interpolation signals between discrete original pixels used for calculating an output pixel value are calculated using as an interpolation function a function obtained by on composing a function based on a cubic convolution

method and a function based on a bilinear method (Fig. 19). Nakami teaches that this hybrid (bilinear/cubic) bicubic function is useful in increasing the sharpness of the image (column 12, lines 25-30). Nakami also teaches that the amount of computation is becomes increasingly larger for the cubic method and that the trade off between image quality/sharpness and processing speed is optimal using the bicubic function (column 12, lines 30-39).

Nakami does not explicitly disclose an FIR digital filter using the interpolation function. FIR filters are exceedingly well known in the art to be used in interpolation. Suga teaches that FIR filters are known to be used for both linear and cubic interpolation methods (column 2, lines 23-40). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use an FIR filter to output the interpolated data from the linear and cubic interpolation method of Nakami as taught by Suga.

Nakami further discloses wherein said interpolation function is a function that is obtained by composing a part of the function based on the cubic convolution method and a part of the function based on the bilinear method. Nakami further discloses where the interpolation is asymmetric with respect to the right and left (Fig. 19). The discussion of the use of an FIR filter as taught by Suga with regard to claim 1 also applies.

The function taught by Nakami is clearly composed of both cubic and bilinear functions and is furthermore asymmetric with respect to right and left. This is clear in fig. 19. Nakami does not discuss implementing the function using a FIR. However it is

well known in the art that filters are used to perform and implement interpolation functions such as cubic and bilinear methods. Suga teaches that FIRs are used to implement any number of interpolation functions and explicitly mentions both cubic and linear methods. It only follows that a FIR would be used to implement the interpolation function disclosed by Nakami. Indeed Nakami's function will have to be applied to the image data in operation in some manner. The most common and exceedingly well-known method in image processing for implementing an interpolation function is through the use of a filter. Suga clearly teaches that an FIR may be used in implementing both cubic and linear methods. One of reasonable skill in the art would obviously conclude that the combination function determined by Nakami would be applied using a filter and Suga teaches explicitly that a FIR filter is used.

With regard to claim 3, the discussion of claim 1 applies. Nakami discloses an apparatus to be used with his method (Fig. 2).

With regard to claim 5, Nakami and Suga disclose the method as claimed in claim 1, and they are both considered to disclose that the method is for use in enlarging or reducing the digital image because that is what interpolation is inherently used for. When interpolation is performed pixels are created or reversely they are deleted inherently expanding or decreasing the image.

With regard to claim 6, the discussion of claim 5 applies.

With regard to claim 7, the discussion of claim 3 and claim 1 apply. Both the references to Nakami and Suga are interpreted to operate as electronic devices (Suga Fig. 1B and Nakami Fig. 2).

With regard to claim 8, the discussion of claim 5 applies.

FINAL REJECTION

6. Applicant's amendment necessitated the grounds of rejection presented in the Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wes Tucker

5-15-07



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